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WASHINGTON, DC 20036-3307

EXAMINER

KALAFUT, STEPHEN J

ART UNIT	PAPER NUMBER
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1795

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PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary

Application No.

09/501,621

Applicant(s)

MILLS, RANDELL L.

Examiner

Stephen J. Kalafut

Art Unit

1795

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 30 October 2007.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-273 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-273 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date 30 October 2007.
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____.
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: _____.

A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 30 October 2007 has been entered.

Claims 1-273, for reasons of record as applied to claims 1-262, are rejected under 35 U.S.C. 101 because the claimed invention lacks patentable utility. See paper nos. 3 and 11.

Claims 1-273, for reasons of record as applied to claims 1-262, are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the enablement requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to enable one skilled in the art to which it pertains, or with which it is most nearly connected, to make and/or use the invention. See paper nos. 3 and 11.

Applicant's arguments filed 30 October 2007 have been fully considered but they are not persuasive.

Regarding applicant's argument that the microwave-field Balmer line broadening in the Luque *et al.* paper being allegedly six orders of magnitude too low too account for that reported by applicant, see the attached Appendix, pages 14-15.

Applicant argues that the arguments by the "Committee" in the Advisory Action, concerning the difference in profile shapes in figures 4a, 4b and 4c of Cvetanovic *et al.* are

without merit. Applicant states that he as computer-fit the data himself, which fits a Gaussian profile corresponding to Doppler broadening. This is not persuasive because the difference in profile shape is apparent to the naked eye, and needs no computer fitting. Also see the attached Appendix, pages 9-12.

Applicant repeats his argument that Lieb disproves Krieg. Lieb does not reject the Heisenberg uncertainty principle entirely, but instead differs with an argument that is often based thereon. See page 555, left column, first two paragraphs. He states that "Eq. (4)" (which is on page 554), from the Heisenberg uncertainty principle, is correct, but "it is a pale reflection of the power of the operator $-\Delta$ to prevent collapse" (page 555, left column 4th paragraph). Lieb then offers the Sobolev inequality as a "better uncertainty principle". Nowhere, however, does Lieb ever allow for hydrogen atoms going below the conventionally known "ground state".

Applicant argues that one skilled in the art need only compare the equations in his theory with those of Rathke's paper to determine if the sign of the classical wave equation is correctly presented. It is initially pointed out that while the previous Advisory Action implied that Rathke's paper was unavailable, it was actually the articles cited by Rathke that were not available, rather than Rathke's paper itself. Any confusion on this matter is regretted. However, one of the articles by applicant, from *Int. J. Hydrogen Energy*, has become available due to being included in the IDS of 30 October 2007, thus allowing a comparison to be made. In both Rathke and applicant's article, the sign between the first character, an upside-down Greek upper case delta (Δ), and the expression $1/v^2 \delta^2/\delta t^2$, in the classical wave equation, is minus. There is thus no evidence whatsoever that Rathke committed fraud by changing a sign. Applicant's allegation that the "Committee" is complicit in perpetrating the alleged fraud is completely without merit.

Applicant argues that the "Committee's" argument regarding " $q = 9$ when $p = 3$ " is not correct, since in the transition step 54.4 eV is transferred to the catalyst and the other 54.4 eV is emitted as a photon. Applicant appears to misunderstand the "Committee's" argument. From applicant's own formula, values of q are calculated from p^2 . The square of 3 is 9, thus giving the value of q . This is not the calculation of a transition, but of the energy level of a particular value of p . Regarding the "hypothetical change of energy of $q = 5$ " occurring when " p changes from 2 to 3", this is $3^2 - 2^2$ equaling $9 - 4$, which gives 5. Even assuming that part of the energy is transferred to a catalyst, the overall change is $q = 5$.

Applicant's attachments 115 and 116 would fall into category (4), as set out in the action of 10 February 2004, because they speculate hydrino formation as an explanation for data not necessarily caused thereby.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Stephen J. Kalafut whose telephone number is 571-272-1286. The examiner can normally be reached on Mon-Fri 8:00 am-4:30 pm.

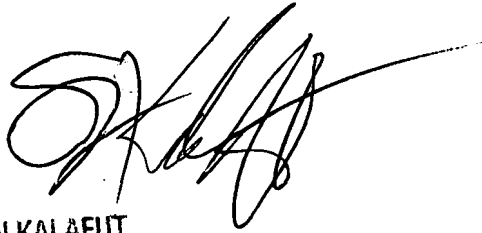
If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Patrick J. Ryan can be reached on 571-272-1292. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

sjk


STEPHEN KALAFUT
PRIMARY EXAMINER
GROUP

1700

Appendix A

Examiner Souw's Response to Applicant's Appendix Filed on 5-23-2005 in U.S. Application SN 09/669,877

The present appendix is Examiner Souw's response to Applicant's reply to the Appendix attached to the Advisory Action mailed on 05/12/2005 in application SN 09/669,877 (hereinafter referred to as the previous Appendix). The previous Appendix was also attached to Office Actions in Applicant's copending cases, namely in application SN 09/009,837 mailed on 02/10/2005; in application SN 09/009,455 mailed on 02/09/2005; in application SN 09/111,003 mailed on 02/09/2005; and in application SN 09/225,687 mailed on 02/09/2005. The previous Appendix refers to an earlier Appendix attached to application SN 09/009,837 mailed on 02/11/2004 (hereinafter referred to as the original Souw Appendix). The previous Appendix attached to application SN 09/669,877 refers to topics and page numbers in the amendment filed by Applicant on 8/11/2004 in application SN 09/009,837. The present appendix will only address Applicant's arguments that are relevant to the previous Appendix. Topics not relevant to the merits of the application will not be considered.

I. Theoretical Part (Regarding Applicant's response to Part II of previous appendix)

(1) Sections 60, 68, 71-75, 80, 82-86, 88, 89, 91-94, 96, 97, 100, 103, 110 and 114 of Applicant's present appendix repeat arguments already refuted. In a few cases where there are new citations presented by Applicant, these arguments are incorrect. Applicant has failed to persuasively argue against Examiner's specific refutation in the previous

Appendix. Instead, Applicant keeps insisting his own preposition (GUT/CQM) that has been previously rejected and disqualified by Examiner, while denying the validity of conventional quantum mechanics (referred to by Applicant as standard quantum mechanics, SQM or QM). A typical example of Applicant's insistence is, "*According to SQM textbooks, the electron is in the nucleus. A theory of the hydrogen atom can not be correct if it requires that the electron is in the nucleus*" (as recited on pg. 215 of the appendix in sect. 114, lines 7-8 filed 5/23/2005). In basic quantum mechanics (also known as QM or SQM using Applicant's terminology), the radial electron probability density of hydrogen(like) atom is mathematically defined as $r^2 R_{nl}^*(r) R_{nl}(r)$ (see original Souw Appendix, pg.11, section 9, last paragraph, which also agrees with Applicant's reference, McQuarrie, pg.221), is identically zero at the nucleus ($r=0$), so there is no electron at --or going through-- the nucleus. This single error alone, of which Applicant refuses to admit, despite Examiner's repeated refutations already raised in the previous Appendix (pg.39, last paragraph), demonstrates Applicant's misunderstanding of quantum mechanics. This erroneous argument was previously advanced by Applicant and refuted by the Examiner in the previous Appendix on page 39, last paragraph. Applicant continues to misinterpret QM (quantum mechanics). Another example of Applicant's erroneous argument is Applicant's persistent repetition of nonsensical mathematics, i.e., that Applicant's electron density solution (in the form of a δ -function) does not need to satisfy its generic differential equation. The logical flaw in the mathematics is self-evident, and has been already refuted in the Examiner's previous Appendix on pgs.18 and 20, but insisted again in Applicant's response (see page 45 of appendix filed on 5/23/2005 in U.S. Serial No. 09/669,877).

(2) As per section 59, Applicant's response regarding "curve-fitting" in Condon & Shortley's work is erroneous, since said classic work involves no computer curve fitting at all, but only analytical formulas for transition probabilities and line intensities derived from first principle. This erroneous argument by Applicant illustrates his misunderstanding of QM, while confirming the Examiner's argument that Applicant's GUT/CQM is incapable of predicting/calculating line intensities and transition probabilities as derived by Condon & Shortley and applied by the Examiner in his scientific article cited on pg.17 of the previous Appendix, which does not involves any curve fitting.

(3) As per sections 72, 74, 80, 84, 85, 88, 89 and 91-94, Applicant's entire attempt to justify his misinterpretation of McQuarrie's formulas only reveals his total misunderstanding of his own reference, as laid open on pp.24-32 of the previous Appendix.

(4) As per section 64, the allegation of Examiner's "misunderstanding" Applicant's "invention" is incorrect: the statement that $n=1$ being radiative is Applicant's own statement, as recited in his 83-page amendment in SN 09/009,837 filed 08/11/2004, (as recited in its first line under (A) General Argument). On page 39 of said 83-page document Applicant states: "*Applying Haus's theorem to the point particle that must have radial kinetic energy demonstrates that the Schrödinger solution for the $n = 1$ state of hydrogen is radiative.*" Applicant is confusing the issue and not advancing prosecution

by incorrectly stating that Examiner made certain scientifically incorrect statements when the record clearly indicates that the Examiner did not.

(5) Regarding sections 54, 61-63, 67, 68, 71, 76-78, 82, 83, 86, 87, 90-92, 94, 100, 101, 102, 104, 105, 109, 111, and 115, Applicant attacks the QM (quantum mechanics) and related theories that have been successfully verified over many decades, instead of using the opportunity to refute Examiner's arguments against GUT/CQM and justify his own theory.

(6) As per sections 55, 60-63, 66, 68-70, 74-76, 79, 80, 82, 83, 88, 91, 92, 95,-97, 102-104, 112, 116, 117 and 118, Applicant again cites his own papers that have been previously disqualified as being one or more of the types (a), (b) and (c) recited in the previous Appendix, section (A), and/or citing new references that fall again into the same category.

(7) As per section 54, Applicant presents book reviews of his book "The Grand Unified Theory of Classical Quantum Mechanics" from persons (see for example attached copy of book review by S.T. Brewer of Applicant's book R. Mills, "The Grand Unified Theory of Classical Quantum Mechanics" [online]. Amazon.com, Inc., 1996-2005. [retrieved on 2005-09-16]. Retrieved from the Internet:[URL:www.amazon.com/gp/product/product-description/0963517139/ref=dp_proddesc_0/104-0714117-9071922?%5Fencoding=UTF8&n=283155](http://www.amazon.com/gp/product/product-description/0963517139/ref=dp_proddesc_0/104-0714117-9071922?%5Fencoding=UTF8&n=283155), which is identically reproduced in Applicant's present appendix) having no authority/expertise in any of the following

pertinent areas: 1) advanced physics with a thorough understanding and knowledge of Quantum Mechanics (QM) which Applicant has alleged he has refuted with his own flawed theory, or 2) plasma physics which Applicant is heavily relying on to provide experimental support for his flawed theory. Even if the book reviewers (Drs. J. Phillips, S.T. Brewer, G. Landvogt, J.J. Farrell) might have some expertise in the pertinent area, their expert opinion does not have any weight as Opinion Evidence in case of §112/¶1 rejection applied in the instant case, since it is not supported by factual evidence. See MPEP § 716.01(c). *In re Chilowsky*, 306 F.2d 908, 134 USPQ 515 (CCPA 1962) (expert opinion that an application meets the requirements of 35 U.S.C. 112 is not entitled to any weight; however, facts supporting a basis for deciding that the specification complies with 35 U.S.C. 112 are entitled to some weight); *In re Beattie*, 974 F.2d 1309, 24 USPQ2d 1040 (Fed. Cir. 1992) (declarations of seven persons skilled in the art offering opinion evidence praising the merits of the claimed invention were found to have little value because of a lack of factual support).

(8) As per sections 56-58, 60, 62, 64, 81, 87, 88, 95, 99, 111 and 112, merely stating that the Examiner is wrong is not a valid argument.

(9) Regarding sections 65, 98 and 106-108, philosophy is totally irrelevant to the real world, as already recited in the previous Appendix. Even more irrelevant is philosophical arguments in patent examination, since philosophy belongs to non-statutory subject matter.

(10) Conclusion: Since **NONE** of sections 54-116 of Applicant's 05/23/05 response is persuasive, the entire Theoretical Part of the previous Appendix, and hence, the Examiner's rejection of Applicant's hydrino/GUT/CQM theory, as brought up in the original Souw Appendix, stand unrefuted by Applicant. The claims based on Applicant's flawed hydrino/GUT/CQM theory thus remain appropriately rejected under § 101 and § 112/¶1 .

II. General Arguments and Experimental Parts

As in the previous Theoretical Part, a majority of Applicant's response is again based on irrelevant arguments such as philosophical arguments, allegations that the Examiner made certain incorrect scientific statements when the record clearly indicates that the Examiner did not, and Applicant's continued misinterpretation of Quantum Mechanics.

(11) Applicant's irrelevant arguments are found in the following sections of his response:

► Specifically regarding sect. 25, the references Cvetanovic and Jovicevic et al. do not confirm Applicant's results, as claimed by Applicant, since none of them ever recites hydrino (see also later Sections 42-51).

► Specifically regarding sections 27 and 53, there are a plethora of phenomena not yet explainable by presently existing theories, so far. This situation is fully acceptable and also understandable, since it represents evidence that science is in (perpetual) development. However, Applicant's GUT/CQM cannot possibly provide a valid explanation for reasons that have been clearly formulated in the previous Appendix on

pg.21. In order to qualify as scientifically valid, a theory must satisfy definite criteria. Among others, it must be logically (i.e., mathematically) correct and free from contradiction, both with known natural laws as well as with itself, in addition to being supported by experimental evidence. As already explained in detail throughout the previous Appendices, Applicant's GUT/CQM does not satisfy these criteria.

(12) Sections 28-30, 34 and 37 consist of scientifically unfounded assertions by Applicant, since Applicant's GUT/CQM has been already refuted in the previous Appendix. Contrary to Applicant's assertions, he has not disproved Quantum Mechanics. As stated by Applicant in section 34, Applicant's CQM is the first to predict novel lower-energy states of hydrogen. He is the first to predict such states because these new states of hydrogen are not supported by or accepted by conventional science.

► Specifically regarding Sect.29, Marchese's Final Report contradicts Applicant's claim of superior rocket thrust and/or excessive heat production, but only conform to the conventional thrust and/or heat from ordinary chemical reaction.

► Specifically regarding Sections 30 and 37, arguments for the incredibility of GUT/CQM have been unambiguously specified in the previous Appendix and discussed at great lengths in the previous consecutive actions, without any persuasive counter-argument from Applicant.

(13) As per Sections 28, 31, 32, 33, 35, 37-39 and 43-52, these sections again cite Applicant's own papers that have been previously disqualified for being one or more of

the types (a), (b) and (c) recited in the previous Appendix, section (A), and/or citing new references that fall again into the same category.

► Specifically regarding Sections 46 and 48, the few references cited on pg.52 and 57 written by authors other than Applicant do not mention any hydrino or GUT/CQM.

(14) In sections 32, 35, 36, 39, 40 and 53, Applicant makes irrelevant arguments.

► Specifically regarding Sect.32, nitrogen is a gas, which is not to be compared with specific hydride(s) claimed by Applicant, which is a solid.

► Specifically regarding Sections 35-36, Applicant's recitation of elements other than helium does not remove Applicant's error of misidentifying the He-II line as being of hydrino origin.

► Specifically regarding Section 39, the Examiner has never recited that an impurity is an oxidation state, as claimed by Applicant on page 33.

► Specifically regarding Section 40, the previous Appendix clearly identifies lines 1-2 below Fig.29 in Marchese's Final Report, which recites, word for word, "*As shown in Fig. 29b, the measured C* values are on the same order as those measured for chemical rocket propulsion, which is reasonable for the first proof of concept test.*" In his 05/23/2005 Response/Appendix, Applicant has cited a different text that is nowhere to be found in Marchese's original Final Report. Nevertheless, Applicant's recitation does not even support Applicant's claim of "excessive heat", but only increased heat (point V on page 26).

(15) In section 38, Applicant's claim of hydrino hydride's hardness is the only nebulous hardness throughout this prosecution, since the corresponding hardness of all other hydrides are known in hard numbers. As such, Applicant's argument of nebulous hardness of a substance is irrelevant.

(16) In section 41, Applicant argues that his results were reproduced by EarthTech and Marchese. The Examiner strongly disagrees for reasons stated in the previous Appendix. The facts in the record clearly support the Examiner's position when one refers to the Earth Tech and Marchese reports.

(17) Sections 42-51 recite various arguments regarding Doppler broadening:

► Specifically regarding Sections 44-49, in contradiction to Applicant's claim of alleged support of Applicant's hydrino (or GUT/CQM) theory, the 2005 paper by Cvetanovic et al. (also Jovicevic et al. 2004) is totally silent about hydrino, fractional hydrogen energy levels, and/or GUT/CQM, while unambiguously disproving Applicant's RTM model, as recited on page 033302-2 col.1/2nd full paragraph and on pg.033302-7,col.2/1st full paragraph, and refuting Applicant's RTM model in at least 5 conspicuous points. All those reference papers cited on pg.57 merely confirm excessive broadening in hydrogen lines, the latter remaining a well known phenomenon for many decades, even observed by the Examiner himself as far back in 1985 in relation with his work performed at the Air Force Wright Aeronautical Laboratories reported in ref.[10] of Part II of the previous Appendix. As already explained, in order to be correct, a theory must be logically and mathematically flawless and free of contradiction. In order to be true, a theory must be

firstly correct, and further, verified by experimental observation. Applicant's GUT/CQM is mathematically flawed and full of contradiction. Its alleged "experimental evidence" is only argued by Applicant, but never self-evident, or, it is even contradicted by the scientific community, such as by Cvetanovic et al.

► Specifically regarding Section 50, Doppler-free laser spectroscopy recommended by the Examiner is insofar important, as it would ultimately clarify the longstanding puzzle regarding the origin of excessive broadening in hydrogen lines. It is unscientific to make an unsupported statement that the Doppler-free laser spectroscopic line width would be negligible in comparison to the observed broadening, since such measurement has never been actually made in the entire history of hydrogen line broadening anomaly. If and only if it turns out that the Doppler-free (i.e., homogenous) line width is within the conventionally known natural line width can one conclusively conclude that the observed broadening is inhomogeneous (Doppler). However, it may well turn out that the Doppler-free line width is effectively as broad as the observed line width, e.g., in the form of plasma satellites or microwave satellites (Blochinzew effect).

► Generally regarding Sections 42-51, Applicant has clearly misunderstood the diverse units conventionally used to represent line broadening data, as well as their interpretation in light of homogeneous broadening (such as, natural line width or oscillation damping, broadening due to electron impact, static ion field, microwave effects), as opposed to inhomogeneous broadening (such as translational energy spread due to the Doppler shift). It is conventional to express line width measurement data in equivalent units of $[\text{cm}^{-1}]$, $[\text{Hz}]$, and/or $[\text{nm}]$. These units are all equivalent and can be easily converted from one to another by one of ordinary skill in the art. The corresponding conversion formulas

have been previously given in the previous Appendix on page 9-10. These formulas may be verified with the cited references (ref. [9],[10] cited in Part I of the previous Appendix) as well as with any textbook or scientific publication in plasma spectroscopy, such as, e.g., Conversion Table cgs/SI-Units ([online]. [retrieved on 2005-09-16]. Retrieved from the Internet: <URL: www.plasmaphysics.org.uk/convers.htm>) regarding the conversion formulas and the units, and Equation 31 of a paper by S. Johansson and S. Letokhov in Astronomy & Astrophysics 378 (2001) pp. 266-278, regarding the Doppler shift/broadening formula. Thus, according to this general knowledge in the art, Luggenholscher's line width of $\delta\lambda=0.16$ nm is equivalent to $\delta\sigma=3.7$ cm^{-1} (with $\sigma=1/\lambda$) or $\delta\nu=111$ GHz, and Applicant's $\delta\lambda=0.27$ nm is equivalent to $\delta\sigma=10.0$ cm^{-1} or $\delta\nu=188$ GHz (using the basic formula $\delta\nu=c\cdot\delta\sigma$, which is the same as, and hence, giving exactly the same result as $\delta\nu/\nu=\delta\lambda/\lambda$).

While the conversion wave number $\sigma=1/\lambda$ [cm^{-1}] and oscillation frequency ν [Hz] into energy units [eV] is straightforward, conversion of the corresponding line widths $\delta\sigma$ and $\delta\nu$ into energy units [eV] is not possible without considering the homogenous and inhomogenous contributions to the line broadening, i.e., either as damping energy of the oscillating electron, or as translational or kinetic energy of the moving atom, the latter involving the atomic or nuclear mass). Presuming that homogeneous line width is predominant and the inhomogeneous contribution is negligible, Luggenholscher's $\delta\lambda=0.16$ nm (homogeneous) line width is equivalent to an electron oscillation energy spread of $\delta E_{\text{hom}}=0.45$ meV (*NOT* 4.5 meV, as calculated by Applicant and recited on pages 45 and 57), and Applicant's $\delta\lambda=0.27$ nm (homogeneous) line width is equivalent to $\delta E_{\text{hom}}=0.76$ meV (i.e., using the basic formula $E_{\text{hom}}=h\cdot\nu$ and $\delta E_{\text{hom}}=h\cdot\delta\nu$). However,

assuming the line broadening is predominantly Doppler, the same line width converts to an atomic translational/kinetic energy by virtue of the Doppler formula given on page 10 of the previous Appendix, to give $E_{\text{Doppler}} \approx 15 \text{ eV}$ for Luggenholscher's data, and $E_{\text{Doppler}} \approx (0.27/0.16)^2 \cdot 15 \text{ eV} = 43 \text{ eV}$ for Applicant's data. The intermediate case where the contributions of homogeneous and inhomogeneous broadenings are both not negligible is well known in the art, but here not discussed, since it would not help clarify Applicant's present misunderstanding of converting line widths to different units.

Applicant's comment in Section 48 on page 57 is scientifically unsound: (a) The fact that the Examiner does not use the same conversion formula as Cvetanovic's (2005) does not at all mean that the Examiner's method and results are incorrect. Applicant's allegation is incorrect, insofar as the Examiner's method conforms with the conventional method generally known in the art (ref.[9],[10] cited in Part I of the previous Appendix, and new references, Conversion Table cgs/SI-Units ([online]. [retrieved on 2005-09-16]. Retrieved from the Internet: <URL: www.plasmaphysics.org.uk/convers.htm>) and S. Johansson and S. Letokhov in Astronomy & Astrophysics 378 (2001) pp. 266-278, cited above); (b) the Examiner's calculation is based on Luggenholscher's as well as Applicant's experimental data, but not at all on Cvetanovic's, so there can be no requirement for the Examiner to conform with Cvetanovic's method (which is known in the art to differ by a factor less than one order of magnitude due to Cvetanovic's use of highly directed atomic beam, as opposed to assuming a random distribution of atomic velocities); (c) despite the differences (in his analysis/formula Cvetanovic et al. includes collisional effects in a highly directed atomic beam), the Examiner's result is also consistent with Cvetanovic's, as demonstrated in Table 1 below.

To help Applicant clarify his misunderstanding of elementary plasma spectroscopy, and to clearly elucidate the significant difference between electron oscillation damping energy in case of homogeneous broadening and atomic kinetic or translational energy in case of inhomogeneous Doppler broadening, the Examiner will make use of his past experience as Professor in Applied Physics at a reputable US university (please refer to his short biography in the 2003 SPIE article already known/cited by Applicant) and give the following detailed example.

An atom with oscillating electron that radiates is here made equivalent to a jet fighter that radiates communication electromagnetic waves at 1 GHz in all directions. The typical mass of a jet fighter (e.g. F-16) is roughly 10,000 kg, or 10^7 gm. Assuming a homogeneous radiation line width (as determined by the Q-value of the oscillator circuit) of 1 kHz, we thus have a homogenous line width ratio of $\delta\nu/\nu=10^{-6}$. Assuming this homogeneous line width is due to oscillator damping (i.e., the so-called natural line width), the corresponding oscillator energy spread is $\delta E_{\text{hom}}=h\cdot\delta\nu=4\cdot 10^{-12}$ eV. On the other hand, assuming the same line width is predominantly due to Doppler shift (which becomes an isotropic broadening in case of a large number of radiating jet fighters randomly flying in all directions, equivalent to a random velocity distribution of radiating atoms) the same amount of line width $\delta\nu/\nu=10^{-6}$ corresponds to a velocity of $V/c=\delta\nu/\nu=10^{-6}$, i.e., a (mean) aircraft velocity of $V=300$ m/s, which is a plausible subsonic velocity. The Doppler or kinetic/translational energy is $E_{\text{Doppler}}=0.5\cdot m\cdot V^2 = 3000$ eV. We thus see, although the oscillation energy spread is even smaller than 0.001 eV, the

corresponding kinetic energy of the entire radiator (equivalent to the atomic translational energy) is even larger than 100 eV.

For ultimate comparison, the various equivalent units for expressing the experimental data of Luggenholscher, Applicant, Cvetanovic et al. and the jet fighter are shown in Table 1 below. The numerical values for Cvetanovic's data are taken from Fig.5 that represents cases with negligible homogeneous broadening and calculated according to the undergraduate scaling formula: $E_{\text{Doppler}} \sim (\delta\lambda)^2$, which can be verified using Cvetanovic's own data, $83 \text{ eV} = (0.46/0.40)^2 \cdot 62 \text{ eV}$ (QED), further showing consistency with Luggenholscher's data, $E_{\text{Doppler}} = (3/2) \cdot (0.16/0.46)^2 \cdot 83 = 15 \text{ eV}$, and also with Applicant's data, $E_{\text{Doppler}} = (3/2) \cdot (0.27/0.46)^2 \cdot 83 = 43 \text{ eV}$, wherein the factor 3/2 is introduced to reconcile Cvetanovic's case-specific result referring to a highly directed velocity distribution with the random velocity distribution assumed in a conventional Doppler broadening case (see formula on page 10 of the previous Appendix). Table 1 demonstrates a general consistency of the numerical results.

TABLE 1

	Luggenholscher	Applicant	Cvetanovic et al.	Jet Fighter
$\delta\lambda$	0.16 [nm]	0.27 [nm]	0.46 / 0.40 [nm]	---
$\delta\sigma [\text{cm}^{-1}]$	3.7 [cm^{-1}]	10.0 [cm^{-1}]	---	$3 \cdot 10^{-8} [\text{cm}^{-1}]$
$\Delta\nu [\text{Hz}]$	111 [GHz]	188 [GHz]	---	1.0 [kHz]
δE_{hom} (Oscillator energy spread)	0.45 [meV]	0.76 [meV]	---	$4 \cdot 10^{-12} [\text{eV}]$
E_{Doppler} (Doppler kinetic energy)	15 [eV]	43 [eV]	83 / 62 [eV]	3 [keV]

Note: to save time, the Examiner performed only back-of-the-envelope calculations. Therefore, the above tabulated numerical values are accurate within 10%. This accuracy is by far more than enough to refute Applicant's scientifically incorrect allegation that the Examiner's line broadening numbers were wrong by **SIX ORDERS OF MAGNITUDE in H energy** (Sect. 44 on page 45). Especially Applicant's consecutive wording "*in H energy*" is in grave error, because the oscillator energy spread in [meV] is purely determined by the energy of the oscillating electron and its damping/Q-value, and does not involve the atomic mass of hydrogen, and hence, has nothing to do with "*H energy*", the latter only making sense in case of Doppler broadening (15 eV).

With the above comparisons, the Applicant's repeated allegations in his responses that the Examiner's line broadening numbers were wrong by **SIX ORDERS OF MAGNITUDE** has no basis.

(18) In section 55, Applicant alleges that his hydrino is confirmed by a variety of experimental results.

These experimental results are irrelevant to support Applicant's theory since applicant does not address the First Principle issue raised in the previous Appendix. Alleged match with experimental data from a scientifically invalid theory (GUT/CQM) based on flawed logic and physical concepts & principles, thus leading to totally arbitrary results, does not justify the theory. Furthermore, results from Applicant's own experiments that are unverified or even contradicted by other independent researchers

(e.g. EarthTech, NASA, Cvetanovic et al. (2005), Jovicevic et al. (2004)) are not valid as scientific evidence.

(19) With respect to sections 56-58, Applicant repeats arguments that have been fully addressed in the previous Appendix.

In these sections, Applicant merely contradicts the Examiner's arguments. Applicant continues to misunderstand elementary wave theory.

(20) With respect to section 59, applicant's allegation of computerized curve fitting regarding the QM theory of Condon & Shortley is based on Applicant's total misunderstanding of this classical work in physics. Condon & Shortley's formulas are all analytic, and hence, does not need any computer curve fitting. Thus, Applicant's attempt to "refute" Examiner's Appendix is groundless.

(21) With respect to section 60, see response to section 67 below:

(22) In section 61, applicant does not argue against Examiner's refutation of Applicant's GUT based on mathematical flaws and conceptual errors as recited in the original Souw Appendix. Consequently, those flaws and errors stand unrefuted. Instead, Applicant attacks the Feynman and Heisenberg principle in SQM using mathematically flawed and conceptually erroneous arguments.

(23) With respect to section 62, the erroneous point source basis of Applicant's GUT has been addressed in the original Souw Appendix, which stands unrefuted, because Applicant's response is a mere contradiction without any counter-argument. Unrefuted is also the Examiner's demonstration given in the original Souw Appendix that Applicant's derivation of density function is mathematically wrong and conceptually incorrect while also being in contradiction with Haus's theory.

(24) With respect to section 63, applicant does not argue that the Examiner's proof in the previous Souw Appendix that Applicant's analysis based on Haus theorem is mathematically and physically flawed. Instead of addressing the Examiner's argument,, Applicant attacks the conventional QM (Quantum Mechanics).

(25) With respect to section 64, Applicant's mere allegation of "not having even a basic understanding" without ever refuting the mathematically and physically sound demonstration of the original Souw Appendix is not persuasive. The original Souw Appendix stands therefore unrefuted.

(26) With respect to section 65, Laloe's comments on SQM is philosophical, which is totally irrelevant to the real world, as already recited in the original Souw Appendix. Philosophical dispute is even more irrelevant for patent examination procedure, since philosophy belongs to non-statutory subject matter.

(27) With respect to section 66, applicant's recitation "other theoreticians, such as those at Princeton University" is unpersuasive, since it does not recite any name, or any scientific work other than Applicant's own paper(s), all of which having been determined invalid as support in this instant application. Applicant's tentative recitation of E.H. Lieb's article is flawed and also misleading, since Lieb does not mention anything about hydrino. The fact that SQM contains parts that need improvement is scientifically acceptable, since (a) no physical theory is all encompassing, and (b) there would otherwise be no progress in science. In comparison, the GUT is unacceptable, simply because it is mathematically flawed and in contradiction with the existing physical laws, as described in the original Souw Appendix.

(28) With respect to section 67, contrary to Applicant's assertions, the scientific community agrees with Feynman and Lieb, both being consistent and coherent with the Heisenberg's Uncertainty Principle. Thus, Applicant's argument is unpersuasive. Applicant's reference to the Buliaro et al. article is unpersuasive, because, also like Feynman and Lieb, the Buliaro et al. the article does not recite hydrino.

(29) With respect to section 68, applicant's allegation that the correspondence principle (CP) is incorrect, is against the conventional understanding of physics, as known to those ordinarily skilled in the art, and hence, unpersuasive.

(30) With respect to section 69, applicant's allegation that "the Examiner's error is confirmed by other physicists" is unfounded, because (a) no physicist is named, nor is

any article quoted by Applicant, and (b) Applicant's allegation is merely a contradiction, not an argument, for failing to present any counter-argument against Examiner's facts that has been thoroughly demonstrated in the original Souw Appendix regarding formulas (1.59) to (1.68) and Eq.(1) to (5) of Applicant's GUT.

(31) With respect to section 70, applicant's citation of his own papers against the Dirac's theory is unpersuasive, since the Dirac's theory is well accepted by the scientific community and mathematically sound (P.A.M. DIRAC, NOBEL PRIZE IN PHYSICS, 1933, FOR THE DISCOVERY OF NEW PRODUCTIVE FORMS OF ATOMIC THEORY), whereas Applicant's GUT/CQM underlying Applicant's cited papers has been proven wrong, for reasons stated in the original Souw Appendix, which stands unrefuted. Therefore, Applicant's arguments against the Dirac theory remains unpersuasive.

(32) With respect to section 71, applicant's has failed to provide a mathematical proof as requested by the Examiner, i.e., that Applicant's electron density function does satisfy Applicant's own wave equation. Applicant's inability to provide mathematical proof illustrates just one of the numerous mathematical flaws and conceptual errors in GUT/CQM, as addressed in detail in the original Souw Appendix.

(33) With respect to section 72, Applicant's use of McQuarrie's formula for rigid-rotator has been proven incorrect in the 05/23/2005 Appendix. Since McQuarrie's formula itself has been proven by the Examiner as being consistent with the conventional SQM,

Applicant's error shows that Applicant has misunderstood his own reference, thus disqualifying Applicant's entire argument. Thus, not only is Applicant's argument unpersuasive, it is not even a valid argument, but only a mere contradiction against Examiner's mathematical proof, without presenting any counter-argument and/or mathematical counter-proof. Therefore, Applicant's insistence that his δ -function does not need to satisfy –or must not be a solution of-- the wave equation, is here reconfirmed as being a violation of the basic laws of physics and mathematics. Applicant states on page 130 in the appendix filed on 5/23/2005 in U.S. Serial No. 09/669,877 that “[t]he Examiner's comment about Applicant's argument being ‘unpersuasive because Applicant's response contradicts the mathematical requirement that any valid solution must satisfy the generic equation’ is not well taken. On which physical law is this statement by the Examiner based?”

In response to Applicant's contention, the Examiner's statement is based on one of the fundamental principles of mathematics where a function must solve the equation in order for it to qualify as and be called a solution of the equation.

(34) With respect to section 73, applicant's interpretation of Haus's radiation condition has been demonstrated in the original Souw Appendix as being inconsistent with Haus's theory, and the corresponding derivation in Applicant's GUT also has been proven as mathematically flawed, and hence, invalid as counter-argument. Applicant's claim of “rigorously solved” is unsupported by the facts in the record , since Applicant has failed to provide the rigorous proof so far requested by the Examiner, i.e., that Applicant show

that Applicant's solution for electron density function is a valid solution of the corresponding wave equation which Applicant has not done so.

(35) With respect section 74, as already shown in the original Souw Appendix, Applicant's angular momentum wavefunctions have been mathematically proven incorrect. Furthermore, Applicant's derivation of angular momentum functions using McQuarrie's formula for rigid-rotator also has been proven incorrect in the last 05/23/2005 Appendix. On the other hand, it has been also proven by the Examiner that McQuarrie's formula is consistent with the conventional SQM. Thus, Applicant's mistake shows that Applicant has misunderstood his own reference, and disqualifies Applicant's entire arguments. Consequently, the Examiner's refutation of Applicant's angular momentum wave functions, as well as the Examiner's judgment that Applicant's misunderstands the SQM, are here reconfirmed.

Applicant's further citation of his own papers is unpersuasive evidence, since all those papers are based on a flawed theory (GUT) not supported by any experimental evidence, and hence, they all have been disqualified as support in this prosecution.

(36) With respect to section 75, applicant's claim that GUT or CQM "unifies Maxwell's equations, special and general relativity with atomic physics" is scientifically unfounded, since it has been demonstrated in the original Souw Appendix, as well as in the follow-up Appendices, that Applicant's CQM is in direct violation of Maxwell's equations, special and general relativity and atomic physics. Therefore, Applicant's assertion is a mere contradiction of Examiner's extended proofs, without giving any counter-proofs.

Applicant's additional arguments regarding "top-quark" and "fundamental particles" are recited out of context and must be deemed incredible, since Applicant has totally failed to argue against the main issues in Examiner's refutation, as brought up in the original Souw Appendix as well as the follow-up Appendices. Consequently, the Examiner's judgment regarding Applicant's violations of Maxwell's equations, special and general relativity and atomic physics, is herewith reconfirmed.

(37) With respect to section 76, applicant's attack against SQM is misplaced as well as misleading since it totally misses the Examiner's point, i.e., that "there are plenty of *a priori* basis for a theory to be incorrect, i.e., if the theory is incredible, illogical, and/or self-contradictory, such as GUT or CQM". Therefore, Applicant's argument is deemed unpersuasive, and hence, the CQM stands incredible, illogical, and/or self-contradictory, as already brought up in the original Souw Appendix and in the following Appendices, which are herewith reconfirmed .

Instead of adequately defending against Examiner's arguments, Applicant attacks SQM by predicting alleged "infinities" without any proof, thereby revealing Applicant's own misunderstanding of the most elementary foundations of physics. Consequently, Applicant's unsupported assertions regarding Maxwell and Einstein's Relativity theories are not given further consideration.

(38) With respect to section 77, Applicant's comments regarding demonstrated deficiencies of CQM is a mere contradiction without any counter-argument.

(39) With respect to section 78, this section will be addressed in the Experimental Section below.

(40) With respect to section 79, applicant's misunderstanding of the correct definition of current density in applying the Haus's condition remains factually unrefuted for reasons given in the previous appendices. Consequently, Applicant's formal and conceptual mistake in handling the Haus's radiation condition is herewith confirmed.

(41) With respect to section 80, applicant's failure to argue against his mistake regarding the density δ -function has been sufficiently discussed in the previous sections 74 and 76, and hence, will not be addressed herein. Furthermore, these two sections also disclose Applicant's failure to understand his own McQuarrie reference.

(42) With respect to section 81, applicant's claim of a "successful application of special relativity" is a mere contradiction without any support against a mathematical exposition of Applicant's misunderstanding and mis-application laid open by the Examiner in the original Souw Appendix.

(43) With respect to sections 82-83, applicant's response confirms Applicant's misunderstanding of eigenfunctions and wave functions, since Applicant's angular momentum functions are wave functions, not eigenfunctions of the angular momentum operator, as already brought up in the original Souw Appendix. Furthermore, not only is

Applicant's renewed attack against SQM unjustified, but more importantly, it is without support. Applicant's citation of his own papers is unpersuasive, since such papers is based on flawed mathematics and conceptual errors, and have been thus disqualified as support in this prosecution.

(44) With respect to sections 84, 85, 88, 89, and 93, applicant's failure of persuasively arguing his misunderstanding of his own reference, McQuarrie, as demonstrated in the 05/23/2005 Appendix, has been adequately discussed in previous sections 74 and 76, and hence will not be addressed herein. It is important to emphasize, Applicant's misunderstanding of his own reference, as demonstrated in the last Appendix, ultimately disqualifies Applicant's entire arguments regarding the subject matter of Quantum Mechanics (QM or SQM). Applicant's renewed attack on SQM by citing a new reference (Fowles, referring to section 84), as well as Applicant's own papers (sections 85 and 88), is not only misplaced but also unpersuasive, for being based on Applicant's misunderstanding of the SQM fundamentals, as already brought up in the original Souw Appendix and the following ones. Applicant's attacks on SQM do not change the fact that Applicant's GUT/CQM does not agree with physical laws and mathematical principles.

(45) With respect to section 86, Applicant's removal of Y_{00} from his basis set is well documented in Applicant's main reference (GUT); as such, Applicant's mistake in removing Y_{00} out of the complete set of angular momentum eigenfunctions is clearly evident in the record. Applicant's counter-attack on SQM is totally misplaced and

unpersuasive, since SQM does not contain this fundamental mathematical error that is present in Applicant's theory.

(46) With respect to section 87, the SQM is fully consistent with the Heisenberg Uncertainty Principle, whereas Applicant's CQM has been proven inconsistent, and hence, incorrect. Applicant's renewed attack on SQM based on Applicant's own invalid paper does rectify the insufficiencies of Applicant's CQM.

(47) With respect to section 90, contrary to Applicant's assertions, the SQM is widely acknowledged as being the most successful theory in the entire history of physics. On the other hand, Applicant's GUT/CQM has not received even a single acknowledgement from the scientific community; and most importantly for this prosecution, it has been proven wrong in the original Souw Appendix and confirmed by all following Appendices. None of the demonstrated mistakes in Applicant's theory has been successfully argued by Applicant. Therefore, CQM is rejected as a valid basis for any of Applicant's experiment.

(48) With respect to sections 91, 92, and 94, the use of Pauli wave functions is well established in physics. The Pauli wave functions are mathematically correct and also supported by a large number of experimental measurements (including Examiner's own works/publications). On the other hand, Applicant's GUT/CQM is full of mathematical flaws and conceptual errors, as explained up in the original Souw Appendix and all the

following Appendices, without Applicant ever being able to present a single persuasive counter-argument.

Applicant's failure of persuasively arguing his grave misunderstanding of his own reference, McQuarrie, as demonstrated in the 05/23/2005 Appendix, has been thoroughly discussed in previous sections 72, 74, 76, 84, 85, 88, 89 and 93. Therefore, they do need to be repeated again. However, it is here important to emphasize, that Applicant's misunderstanding of his own reference, as demonstrated in the last Appendix, ultimately disqualifies Applicant's entire arguments regarding the subject matter of Quantum Mechanics.